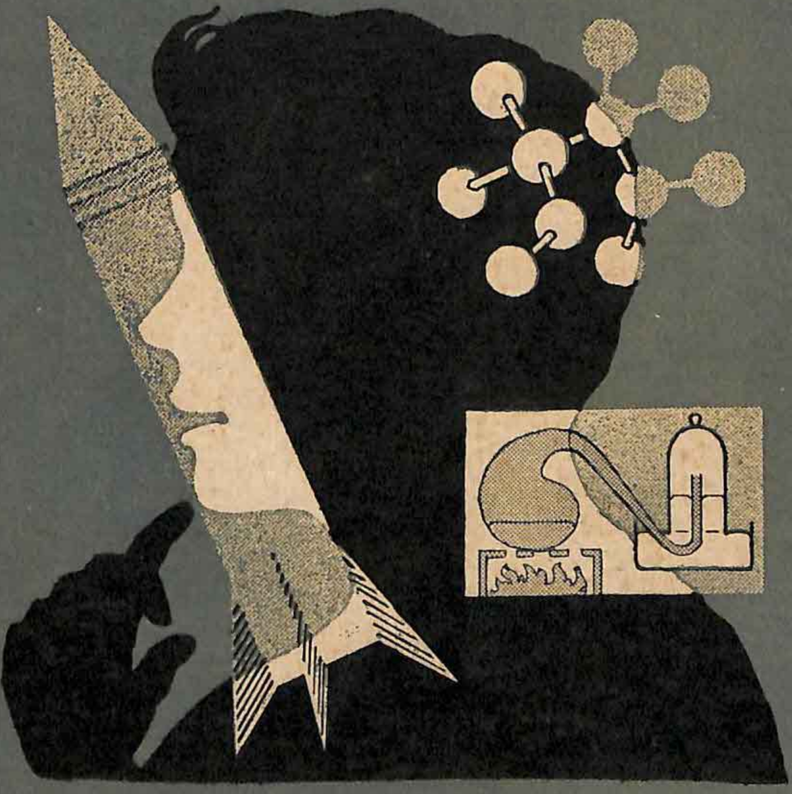
2064

WORKBOOK FOR SCIENCE IN EVERYDAY LIFE

BOOK THREE

by
A. VERSTRAETEN
and
N. A. WATTS



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FOREWORD

As a result of the advances in Science and Technology the vocational foundations of the structure of Society are changing and, therefore, it is essential for all Secondary School pupils to be familiar with certain scientific ideas which underlie progressive thought and activity at all levels.

The purpose of this series of General Science books is to provide such pupils with a broad basic knowledge of scientific facts.

Mere instruction in Science will not capture what is termed the 'spirit of science'. Westaway rightly points out: "The spirit of science cannot be weighed and measured even if weighing and measuring are necessary for tracking it down. It is not enough to track it down, it must be captured. . . . ." The authors have succeeded, I believe, in presenting scientific ideas in a manner which will not only instruct but interest pupils and thus help them to capture the spirit of Science.

A. E. T. BARROW,
M.P., B.A., H.DIP.ED. (DUBLIN), T.D.
Secretary to the Inter-State Board for
Anglo-Indian Education,

and

Secretary to the Council for the Indian School Certificate
Examination (University of Cambridge Local
Examinations Syndicate)

SCIENCE IN EVERYDAY LIFE

Books I, II, III and IV

Workbooks I, II, III and IV to accompany
each text-book

Teachers' Manual including Key to Workbooks

STATE INSTITUTE OF EDUCATION
NIPUR

PREFACE

Science has come to form such an integral part of our daily lives that a knowledge and understanding of its facts is regarded as one of the major goals of education. Furthermore, the development of a scientific attitude and a knowledge of how to apply the methods of science to the solution of personal problems is regarded as an important outcome of the educational process.

The workbooks accompanying the series of books entitled SCIENCE IN EVERYDAY LIFE are designed to meet the problems of learning meaningful scientific facts and their translation into life patterns. They include material and suggested experiences through which the student can check his knowledge of facts, clinch his understanding of the basic concepts developed in the text and gain practice in the skills of solving problems, evaluating and interpreting facts, testing hypotheses, formulating generalisations and applying his understanding to everyday situations. The tests in the workbook also furnish the teacher with an instrument of measuring individual pupil differences in capacity and achievement and the status of the class as a whole, while a critical survey of the scores afforded by the tests reveal the efficiency of certain methods of instruction.

Each workbook contains tests which are constructed parallel to the chapters in the text-book it accompanies, so that the student's mastery of each chapter is facilitated. At the end of each part or book are tests which require the integration of the knowledge gained in the preceding chapters in order to be answered correctly.

The sheets in the workbook may be distributed separately in schools where a loose-leaf file is in use for the subject, or the workbook can be used intact. In either case, the corrected exercises should be readily available as a reference for study and review.

The key for each workbook is included in the Teacher's Manual accompanying the series of text-books.

A. VERSTRAETEN
N. A. WATTS

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TESTS ON CHAPTER I

SIMPLE MACHINES AND HOW THEY WORK

Recall

1. What is the formula used to calculate :

a. Work?

b. Mechanical advantage?

c. Efficiency of a machine?

d. Mechanical advantage of the wheel and axle?

e. Mechanical advantage of the gear system?

2. What is meant by:

a. Energy?

b. Friction?

c. A simple machine?

d. The law of the lever?

3. Name:

a. The class of lever which always gives a gain in force.

c. Eight different kinds of energy.

i.________ **ii.**________ **iii.**________ **iv.**________

v.________ **vi.**________ **vii.**________ **viii.**________

4. State:

a. Three purposes why man uses machines.

i.________

ii.________

iii.________

b. The three main different kinds of resistances met with.

i.________ **ii.**________ **iii.**________

c. Three ways of reducing friction.

i.________

ii.________

iii.________

5. Differentiate between each of the following pairs.

a. Potential energy and kinetic energy.

b. Inertia of rest and inertia of motion.

c. Load and effort.

d. Limiting friction and sliding friction.

____

e. Mechanical advantage and the efficiency of a machine.

____

____

____

____

Recognition

6. The following is a list of simple machines. Mark **Q** against those machines that have a mechanical advantage greater than 1; **R** against those that have a mechanical advantage equal to 1 and **S** against those that have a mechanical advantage less than 1.

______**a.** The handle of a pump.

______**b.** Nutcrackers.

______**c.** Fire-tongs.

______**d.** Inclined plane.

______**e.** Winch.

______**f.** Single fixed pulley.

______**g.** Single movable pulley.

______**h.** Block and tackle.

______**i.** Gear system of a bicycle.

7. A girl sits on a sled which is dragged by a boy over a certain distance on a frozen pond. Mark **X** against the data you would require in order to calculate the work done in pulling the sled.

______**a.** The weight of the girl.

______**b.** The weight of the boy.

______**c.** The weight of the sled.

______**d.** The force of friction opposing the motion.

______**e.** The distance moved by the sled.

______**f.** The distance moved by the boy.

______**g.** The force required to move the sled to the given distance.

8. Mark **P** against those items that have potential energy and **K** against those items that have kinetic energy.

______**a.** Coal being dumped from a lorry.

______**b.** A ball hit with a bat.

______**c.** A box at the top of a shelf.

______**d.** A mallet striking a peg.

______**e.** A rat-trap with its spring set.

______**f.** Water in a reservoir.

Understanding

9. Answer the following questions.

a. How can water stored behind a dam produce work?

____

____

b. The class of lever which always gives a gain in distance.

____

c. Eight different kinds of energy.

i.__________ **ii.**__________ **iii.**__________ **iv.**__________

v.__________ **vi.**__________ **vii.**__________ **viii.**__________

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a. Three purposes why man uses machines.

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c. Three ways of reducing friction.

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5. Differentiate between each of the following pairs.

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b. Inertia of rest and inertia of motion.

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c. Load and effort.

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d. Limiting friction and sliding friction.

____

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____

____

e. Mechanical advantage and the efficiency of a machine.

____

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____

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______**d.** Inclined plane. ______**e.** Winch. ______**f.** Single fixed pulley.

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7. A girl sits on a sled which is dragged by a boy over a certain distance on a frozen pond. Mark **X** against the data you would require in order to calculate the work done in pulling the sled.

______**a.** The weight of the girl. ______**b.** The weight of the boy.

______**c.** The weight of the sled. ______**d.** The force of friction opposing the motion.

______**e.** The distance moved by the sled. ______**f.** The distance moved by the boy.

______**g.** The force required to move the sled to the given distance.

8. Mark **P** against those items that have potential energy and **K** against those items that have kinetic energy.

______**a.** Coal being dumped from a lorry. ______**b.** A ball hit with a bat.

______**c.** A box at the top of a shelf. ______**d.** A mallet striking a peg.

______**e.** A rat-trap with its spring set. ______**f.** Water in a reservoir.

Understanding

9. Answer the following questions.

a. How can water stored behind a dam produce work?

____

____

b. When does the driver of a motor car find friction desirable and when does he find it undesirable?

10. A boy performs the operations listed below. On the blank spaces at the left of the operations write the numbers 1-6 to indicate the order of the greatest work done by him to the least work done by him. (Weight of boy= 100 lb.; weight of brick=1 lb.)

______ **a.** The boy lifts the brick from the ground to a table 2 ft. high.

______ **b.** The boy carries the brick up a ladder to a vertical height of 10 ft.

______ **c.** The boy steps from the floor on to a bench 2 ft. high.

______ **d.** The boy runs up a flight of 20 steps, each step being 6 in. high.

______ **e.** The boy raises the brick to a vertical height of 10 ft. by means of a single fixed pulley.

______ **f.** The boy exerts a force of three-quarters of a pound to push the brick to a distance of 2 ft.

11. A certain crowbar is 4 ft. 10 in. long. Calculate:

a. The force a man would have to exert at the free end of the effort arm in order to raise a weight of 144 lb. when the length of the load arm is 10 in.

b. The mechanical advantage of the crowbar.

12. In each of the following problems the length of the see-saw is 15 ft. from end to end.

a. A boy weighing 60 lb. playing see-saw with his sister balances her when the sits 5 ft. away from the fulcrum and he sits 7 ft. away from the fulcrum. How heavy is his sister?

b. The girl moves 1 ft. towards the fulcrum. How must the boy move if the balance is still to be maintained?

c. Later on the two children are joined by an elder brother who weighs 120 lb. In the given space make a diagram to show where the fulcrum should be placed so that the two brothers sit at either end of the see-saw and balance each other.

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13. A gardener pulls a lawn-mower weighing 120 lb. to the top of a flight of steps 3 ft. high, using a strip of wood 5 ft. long as an inclined plane. Calculate:

a. The force with which he must pull the roller parallel to the plane.

____

b. The mechanical advantage of the inclined plane.

____

14. In a certain wheel and axle, the radius of the wheel is 10 in., while the radius of the axle is 4 in. Calculate:

a. The effort required to raise a load of 100 lb.

____

b. The mechanical advantage of the wheel and axle.

____

15. What is the effort required to raise a sack of coal weighing 200 lb. by means of:

a. A single fixed pulley?

____

b. A single movable pulley?

____

c. A single fixed pulley used in conjunction with a single movable pulley?

____

d. A block and tackle consisting of two fixed and two movable pulleys?

____

e. A block and tackle consisting of three fixed and three movable pulleys?

____

16. Account for each of the following facts.

a. The efficiency of a machine is, in actual practice, less than 1.

____

____

b. Tough materials can be cut with less force when placed near the fulcrum of a pair of scissors than when placed near the ends.

____

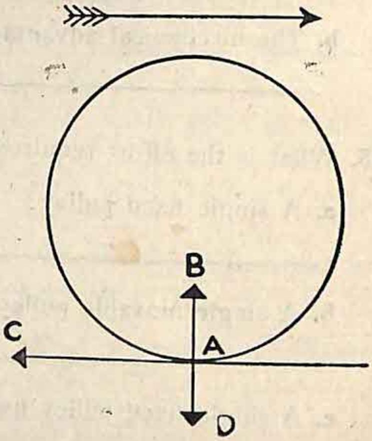
____

c. A river flows faster in the middle than at the sides near the banks.

d. A moving vehicle can do much damage if it strikes something.

e. As a screw is tightened it becomes harder to turn.

17. The diagram represents a wheel of a cart that is moving in the direction of the feathered arrow. Name the forces acting at *A* in the directions as shown by the heavy-headed arrows.



B.

C.

D.

Score

Teacher's initials

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TESTS ON CHAPTER II

GRAVITATION

Recall

1. Answer the following questions.

a. What is essential for producing acceleration?

b. Why is a pendulum used to measure time?

c. Why do we use the expression, 'centre of gravity' of an object?

d. Why is a spring balance used less than a beam balance?

e. What is there common between the fact that bodies fall towards the earth, and the fact that the moon revolves around the earth?

f. What kind of force do you feel when you whirl a sling round and round?

g. When after whirling a sling with a stone in it, why does the stone fly off in a straight line on releasing one end of the string?

h. Why was the launching of artificial satellites made possible only in recent years?

2. What is meant by:

a. Speed?

b. Velocity?

c. Acceleration?

d. The acceleration of gravity?

e. The statement that the acceleration of gravity is 32 feet per second?

f. Binary stars?

g. Planetary nebulae?

3. State:

a. The law of gravitation.

b. Three ways in which the determination of the centre of gravity of an object is useful in everyday life.

i.

ii.

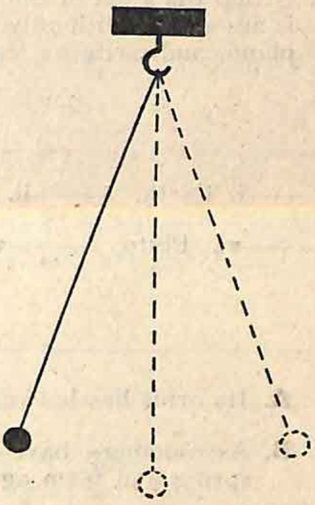
iii.

c. Three different movements made by the earth in space.

i.

ii.

iii.



4. The diagram represents the motion of a simple pendulum.

a. Label on the diagram **(i)** the point of suspension and **(ii)** the bob.

b. Indicate by means of **(i)** an unbroken arrow, the length of the pendulum; **(ii)** a broken arrow, the path taken by the bob during a single vibration; **(iii)** an unbroken heavy-headed arrow, the path taken by the bob during a single oscillation and **(iv)** a feathered arrow, the path taken by the bob during a single amplitude.

5. Distinguish between each of the following pairs.

a. Mass and weight.

b. Neap tides and spring tides.

Recognition

6. Select the number of the item that best completes the statement and write it on the blank space at the left of the statement.

———**a.** A sack of coal weighing 100 lb. taken to the top of a high mountain (i) increases in mass; (ii) diminishes in mass; (iii) increases in weight; (iv) diminishes in weight.

———**b.** The time of swing of a simple pendulum can be increased by (i) increasing the arc of the swing; (ii) increasing the length of the pendulum; (iii) increasing the mass of the bob; (iv) increasing the thickness of the string.

———**c.** The times that high and low tides occur at any seaside town change from day to day on account of (i) the different phases of the moon; (ii) the time taken by the sea to rise and fall; (iii) the variation in the time of sunrise; (iv) the change in the position of the moon in relation to that of the earth.

———**d.** If a man was able to travel in a satellite he would have (i) no mass; (ii) no weight; (iii) a decrease in weight as his distance from the earth increases; (iv) a decrease in mass proportional to his distance from the earth.

7. Group I is a list of the planets in the solar system. Group II is a list of facts each of which is associated with only one of the planets. Select the fact which is associated with a given planet and write its letter on the blank space at the left of the planet.

Group I

———**i.** Earth. ———**ii.** Jupiter. ———**iii.** Mars. ———**iv.** Mercury. ———**v.** Neptune.
———**vi.** Pluto. ———**vii.** Saturn. ———**viii.** Uranus. ———**ix.** Venus.

Group II

A. Its orbit lies between that of Uranus and Pluto.

B. Astronomers have observed white polar caps on it which appear to 'melt' in the spring and form again in the winter.

C. It has 12 satellites.

D. Its period of revolution is the same as its period of rotation.

E. It has a single satellite called the moon.

F. It is almost the same size as that of Neptune.

G. It was discovered in 1930.

H. It appears as the brightest planet in the sky.

I. Astronomers have observed whirling rings around its equator.

8. On the blank spaces at the left of the following planets write the numbers 1-9 to indicate the order of their distances from the sun.

———**a.** Earth ———**b.** Jupiter. ———**c.** Mars. ———**d.** Mercury. ———**e.** Neptune.
———**f.** Pluto. ———**g.** Saturn. ———**h.** Uranus. ———**i.** Venus.

9. On the blank spaces at the left of the following write the numbers 1-4 to indicate the order of increasing complexity.

———**a.** Earth. ———**b.** Galaxy. ———**c.** Moon. ———**d.** Solar system.

Understanding

10. A train leaves a station with a speed of 30 ft. per second and accelerates uniformly at the rate of 5 ft. per sec. Calculate the velocity of the train at the end of 5 seconds.

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11. a. The speedometer of a moving car registers speeds of 15, 18, 21, 24, and 27 miles per hour every second for 5 seconds. What is the car's acceleration?

b. The brakes of the car are applied when the car is running at 30 miles per hour and the readings of the speedometer at the end of successive seconds are 25, 21, and 18 miles per hour. What is the car's retardation:

i. In the first second?

ii. In the second second?

iii. In the third second?

12. A boy runs a hundred yards race in the time of 10 seconds. At what average speed did he run the race?

13. Account for each of the following:

a. Venus shows no definite crust when viewed through even the most powerful telescope.

b. A Bunsen burner is made with a large base.

c. A person riding a bicycle leans in the direction of the turn.

d. Although the gravitational pull exerted by the earth on all bodies is not the same for any particular place, yet the acceleration of gravity of all bodies falling freely in empty space at a particular place is the same.

14. If a tall vase is hit, under what condition will it :

a. Remain standing?

____

____

b. Fall?

____

____

Score__________ **Teacher's initials**__________

NAME ______________________ CLASS ____________ DATE ____________

TESTS ON CHAPTER III

LIGHT IN OUR LIVES

Recall

1. What is the relationship between each of the following pairs?

a. The angle of incidence and the angle of reflection when light is reflected from a surface.

____

b. The angle of a prism and the angle of deviation.

____

c. Illumination and the distance of an object from a light source.

____

d. The passage of a ray of light from a less dense medium to a denser medium and from a denser medium to a less dense medium.

____

____

____

2. Answer the following questions.

a. If you move a book to thrice its original distance from a lamp, by how much will its illumination be diminished?

____

b. What is the chief difference between the action of concave and convex mirrors?

____

____

c. What is the chief difference between reflection and refraction of light rays?

____

____

____

d. Why can the eye be said to be a system of three lenses in contact?

____

____

e. What is meant by the power of accommodation of the eye?

____

____

f. What is the main function of the eye-piece in the microscope and telescope?

g. Why are the largest telescopes reflecting telescopes?

h. Why does a prism produce a spectrum?

3. State:

a. Five steps in the process of seeing a non-luminous object.

i. ____________________

ii. ____________________

iii. ____________________

iv. ____________________

v. ____________________

b. Four ways by which optical instruments help to improve our vision.

i. ____________________

ii. ____________________

iii. ____________________

iv. ____________________

Recognition

4. Select the number of the item that best completes the statement and write it on the blank space at the left of the statement.

____**a.** An object that is flooded by light is said to be (i) incandescent; (ii) luminous; (iii) translucent; (iv) illuminated.

____**b.** The focal length of the eye is controlled by the (i) ciliary muscles; (ii) iris; (iii) retina; (iv) vitreous humour.

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_____**c.** When the image falls ahead of the retina, a person is said to have (i) myopia; (ii) hypermetropia; (iii) presbyopia; (iv) good vision.

_____**d.** When a ray of light passes obliquely from a less dense to a denser medium (i) it does not change its direction; (ii) it is refracted towards the normal; (iii) it is refracted away from the normal; (iv) it is totally reflected.

_____**e.** The condenser of a magic lantern is used to (i) make the object appear larger; (ii) focus an intense spot of light on the object; (iii) invert the image; (iv) make the light diverge on to the object.

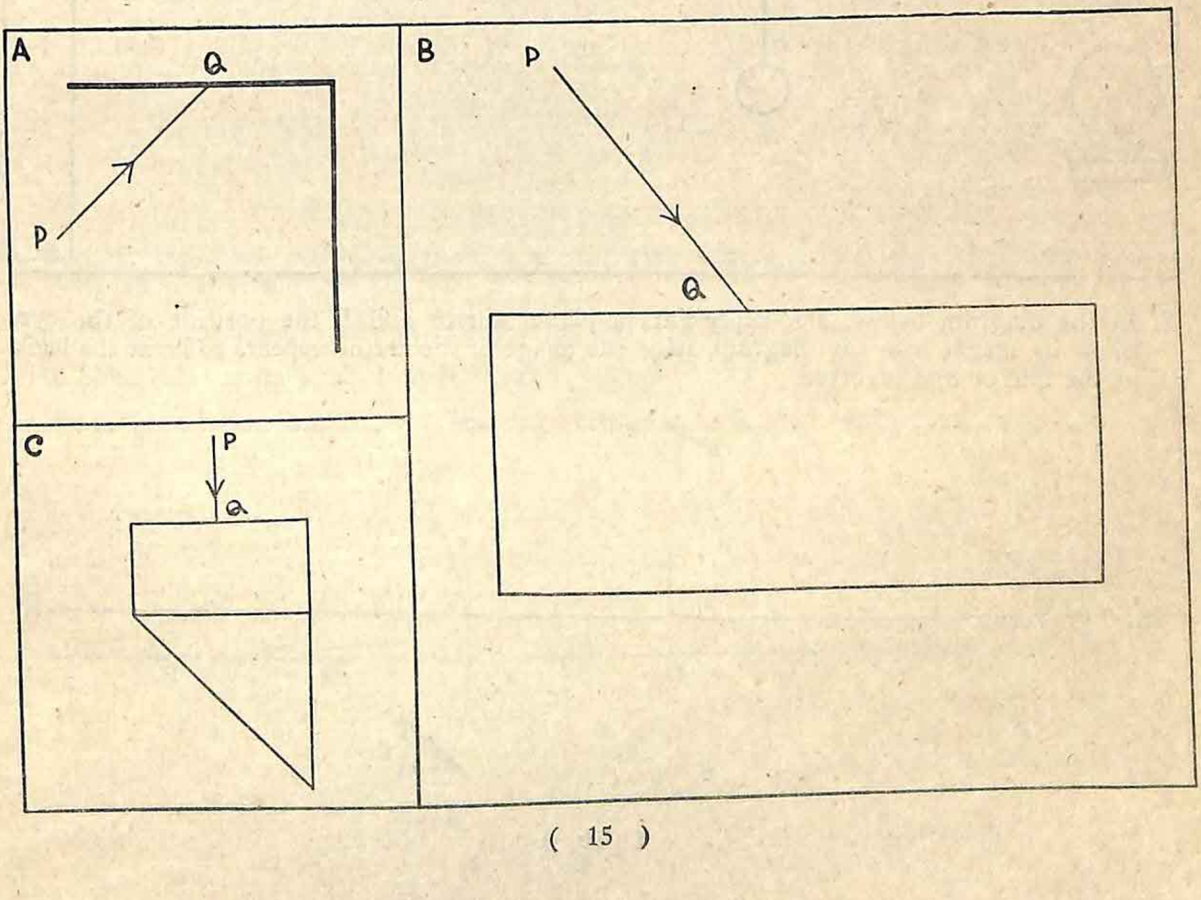
Understanding

5. Trace the path taken by a ray of light *PQ* when:

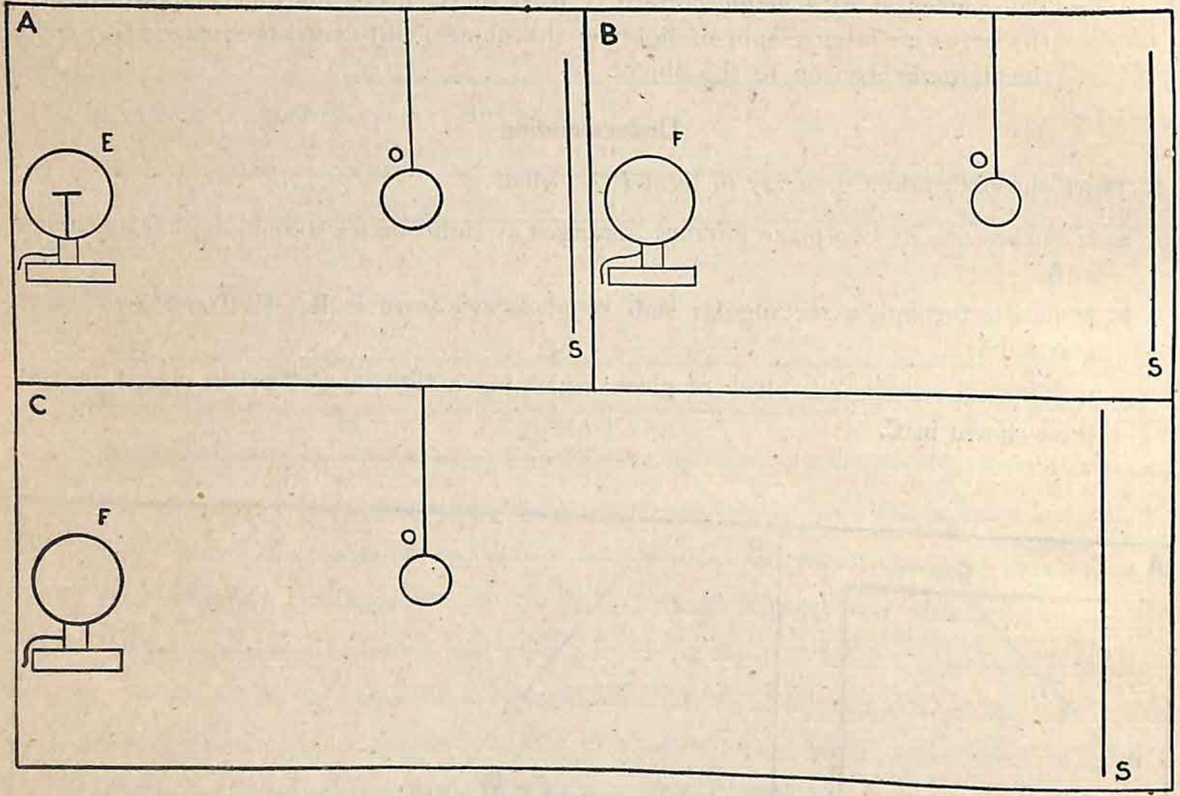
a. It strikes one of two plane mirrors arranged at right angles to one another as shown in **A.**

b. It passes through a rectangular slab of glass as shown in **B.** (Refractive index of glass=1·5).

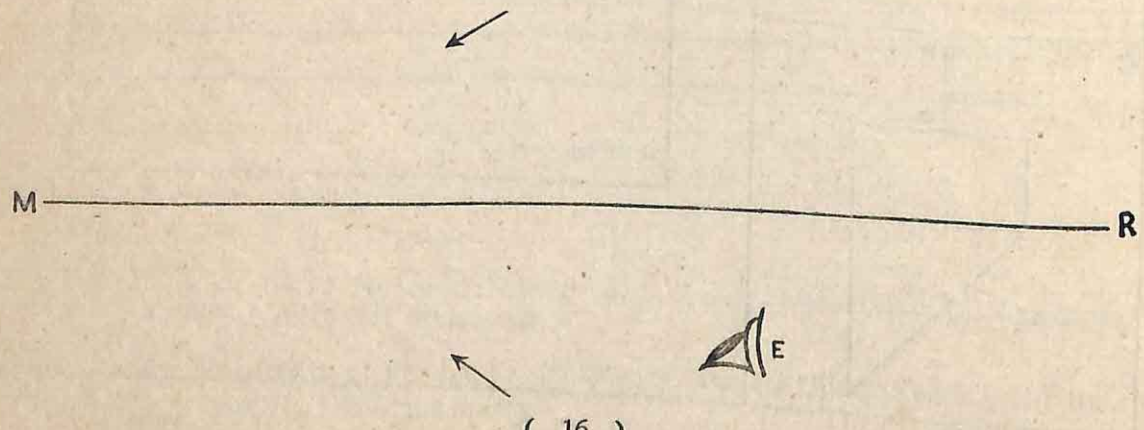
c. It strikes a rectangular block of glass which has a right-angled prism placed next to it as shown in **C.**



6. In each diagram, an orange *O* is shown suspended by means of a fine thread. In **A,** the orange is illuminated by a clear electric bulb *E*; in **B,** it is illuminated by a frosted electric bulb *F* of the same size as the first. In each case a screen *S* is placed at a suitable distance so as to receive the shadow of the orange. In the third case **C,** the arrangement of the frosted bulb and orange is the same, but the screen is moved further away. Make sketches to show the formation of the shadow in all three cases. Indicate by shading, penumbra and umbra.



7. In the diagram below, *MR* represents a plane mirror and *E* the position of the eye. Show by means of a ray diagram, why the image of the arrow appears to be at the back of the mirror and inverted.



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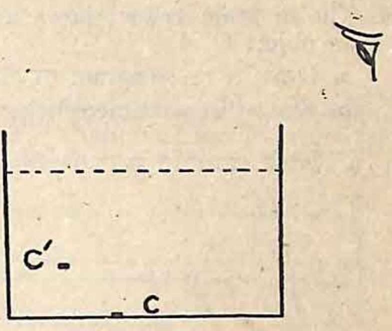
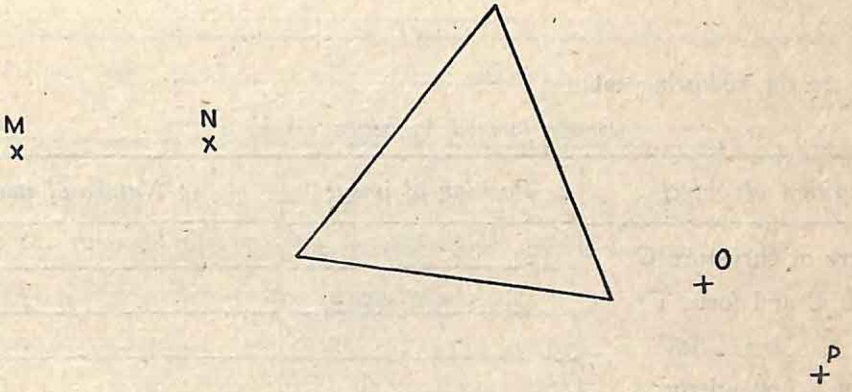
8. In the diagram at the right, *C* represents a small coin placed at the bottom of a pan. When the eye is in the position as shown, the coin is invisible. When water is poured into the pan, however, the coin apparently rises to *C′* and becomes visible, even though the position of the eye remains the same. Draw ray tracks from the coin to the eye to show how this happens.



9. The diagram below shows the positions of four pins *M, N, O* and *P* indicating the path of a ray of light refracted by a prism.

a. Draw the path of the ray through the prism.

b. Label the following: incident ray, refracted ray, emergent ray, angle of incidence, angle of refraction, angle of deviation.

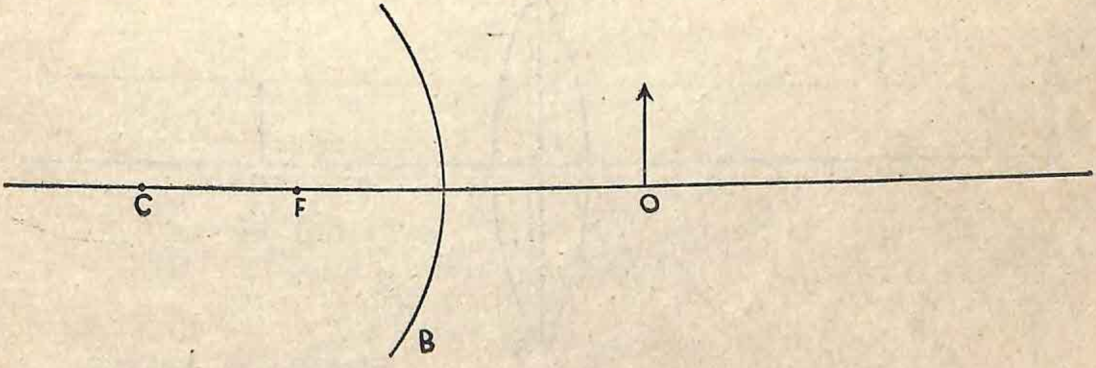


10. The diagram below shows the position of a convex mirror *B*, its focus *F*, its centre of curvature *C* and an object *O*.

a. Draw a ray diagram to show the position and size of the image.

b. State three characteristics of the image produced.

i.__________ **ii.**__________ **iii.**__________

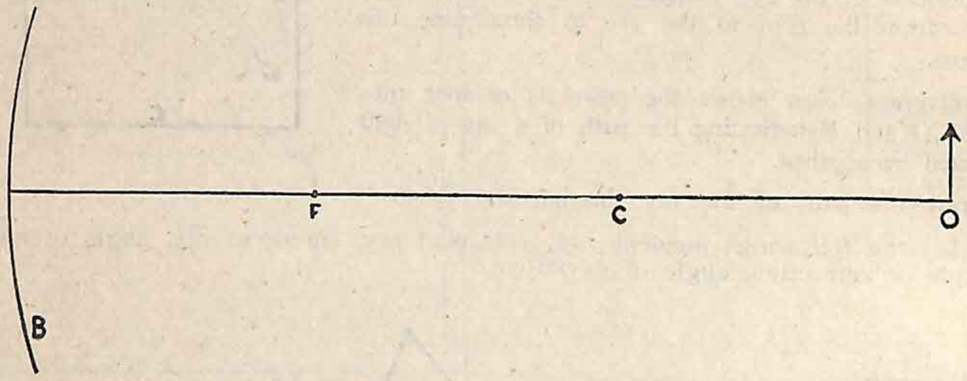


11. The diagram below shows a concave mirror *B*, its focus *F*, its centre of curvature *C*, and an object *O*.

a. Draw a ray diagram to show the position and size of the image.

b. State three characteristics of the image produced.

i. ____________ **ii.** ____________ **iii.** ____________



c. Complete the following table.

Image formed by concave mirror

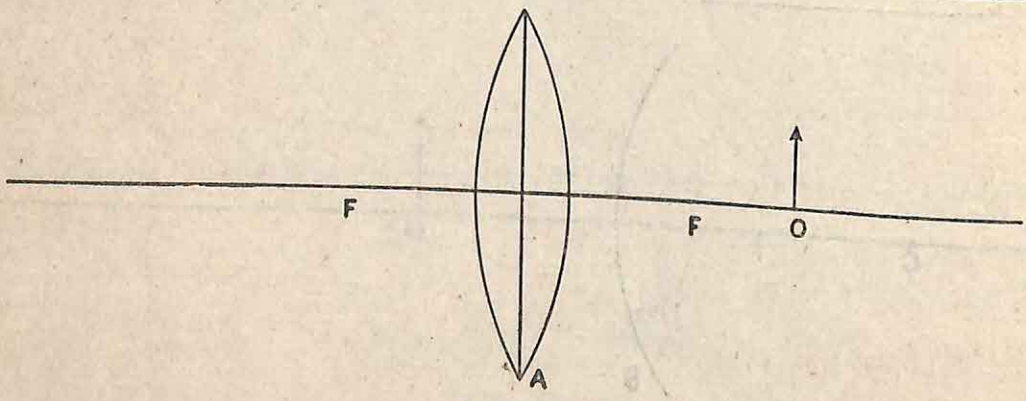
Position of object	*Position of image*	*Nature of image*
At centre of curvature C		
Between C and focus F		
At F		
Between F and mirror		

12. The diagram shows the position of a convex lens *A*, its focus *F* and an object *O*.

a. Draw a ray diagram to show the position and size of the image.

b. State three characteristics of the image produced.

i. ____________ **ii.** ____________ **iii.** ____________



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c. Complete the following table.

Image formed by convex lens

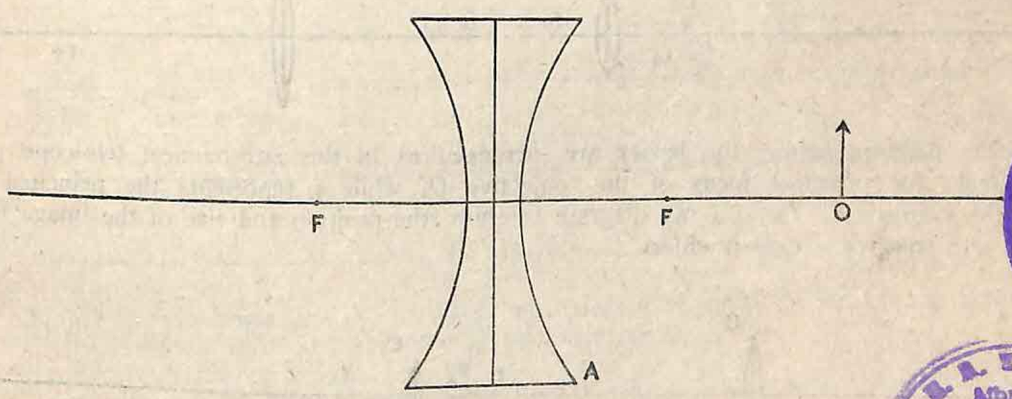
Position of object	*Position of image*	*Nature of image*
At or further than the focal length F		
At 2F		
Between F and 2F		
At F		
Between F and lens		

13. The diagram shows a concave lens *A*, its focus *F* and an object *O*.

a. Draw a ray diagram to show the position and size of the image.

b. State three characteristics of the image produced.

i.____________________ **ii.**____________________ **iii.**____________________



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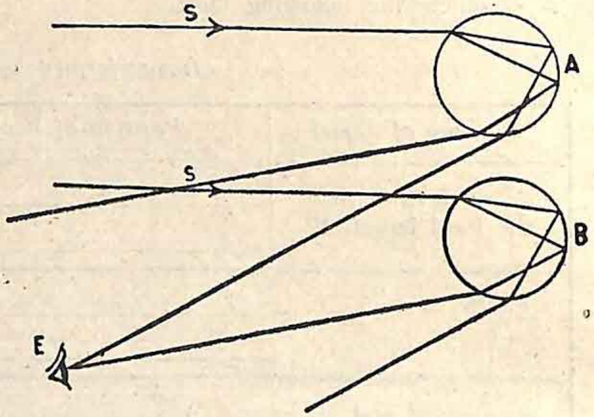
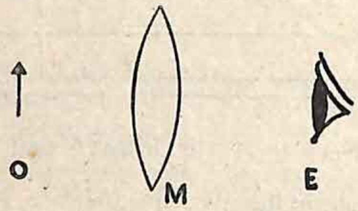
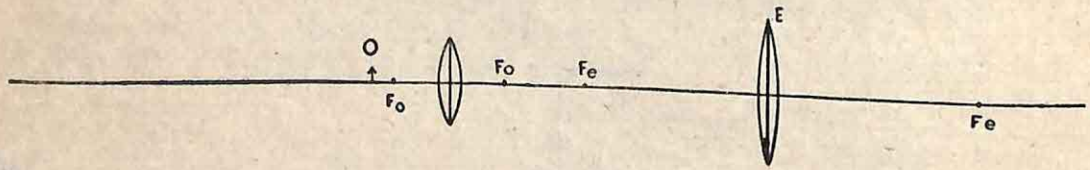
14. In the diagram on the right, the two circles *A* and *B* represent raindrops, while *E* represents the eye of an observer. Rays of sunlight *S*, are shown entering the raindrops, being broken into their constituent colours which then come out in the direction of the eye of an observer. Mark on the diagram the red rays *R* and violet rays *V*.



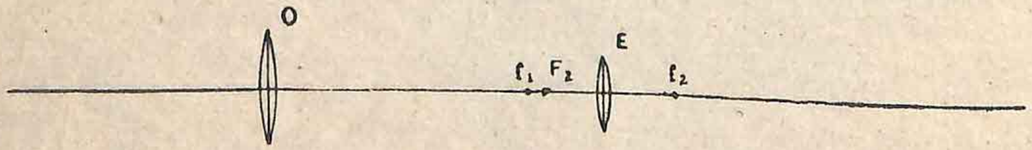
15. In the diagram below, *M* represents a convex lens, *E* represents the eye and the arrow represents the object. Draw a ray diagram to show the position and size of the image.



16. In the diagram below, the lenses are arranged as in the compound microscope. F_o represents the principal focus of the objective *O*, while F_e represents the principal focus of the eyepiece *E*. The arrow represents the object. Draw a ray diagram to show the position and size of the image.



17. In the diagram below, the lenses are arranged as in the astronomical telescope. *F* represents the principal focus of the objective *O*, while *f* represents the principal focus of the eyepiece *E*. Draw a ray diagram to show the position and size of the image formed for one point of a distant object.



NAME ________________________ **CLASS** ____________ **DATE** ____________

18. Account for each of the following facts.

a. A pool of water appears less deep than it is actually.

____

____

____

b. The pupil contracts when bright light is suddenly shone on the face.

____

c. Convex mirrors are preferred as driving mirrors for motor cars.

____

____

d. Writing which has been blotted by blotting paper can be read with the help of a mirror.

____

____

e. Your image appears different on one side of a smooth silver spoon than it does on the other side.

____

____

____

f. If all non-luminous objects had perfectly smooth surfaces it would not be possible to see them.

____

____

g. The image of an object formed by a concave mirror is brighter than that formed by a plane mirror.

____

____

____

h. When telescopes are constructed, an attempt is made to have very large surfaces for the lens or the mirror used in the telescope.

____

____

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i. In the case of large concave mirrors, parabolic mirrors are preferred to spherical mirrors.

j. A concave mirror or a convex lens when placed in the sunlight can produce intense heat.

k. A fish cannot see the sun rising or setting.

Score

Teacher's initials

NAME ______________________ CLASS ____________ DATE ____________

TESTS ON CHAPTER IV
WHAT HEAT CAN DO

Recall

1. Distinguish between each of the following pairs.

a. Evaporation and boiling.

b. Conduction and convection.

c. Real and apparent expansion.

d. Expansion of liquids caused by heat and expansion of gases caused by heat.

e. Good and bad conductors of heat.

2. State :

a. Four factors which determine the rate of evaporation.

i. ____________ **ii.** ____________ **iii.** ____________ **iv.** ____________

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b. Five reasons why mercury is generally chosen as the liquid to be used in thermometers.

i.____

ii.____

iii.____

iv.____

v.____

c. Three things that happen when radiant heat strikes a material.

i.____

ii.____

iii.____

Recognition

3. If a statement is true, write the word true in the blank space below the statement; if false, write the word(s) which should be substituted for the italicised word(s) to make the statement true.

a. In a household refrigerator, the change from gas to liquid takes place in the *freezing unit.*

____

b. *Oxidation* is the chemical process which releases heat from fuels.

____

c. In a vapour-compression type of refrigerator cooling is brought about when *liquid changes to vapour.*

____

d. Heat is felt at a finger-tip when the finger-nail is rubbed vigorously across some smooth surface because of *chemical action.*

____

e. Temperature measures *the amount of heat contained in a body.*

____

4. At the left of each of the following write the letters **Cn,** if the method of transference of heat chiefly involved is conduction; **Cv,** if the method is convection; **R,** if the method is radiation and **E,** if the method is evaporation. Combinations of two or more of these methods may also be selected and written in the given blank space.

______**a.** Davy's safety lamp.

______**b.** Ventilation.

______**c.** Toasting of bread.

NAME________________________________ **CLASS**____________ **DATE**____________

——— **d.** Hot-water heating system.

——— **e.** Cooking vegetables in a pan of water.

——— **f.** Cooling of the body by perspiration.

——— **g.** Cooling the body by sitting in a cool breeze.

——— **h.** Cooling the body by sitting in an unheated room.

——— **i.** Warming the body by standing out in the sun.

——— **j.** Cooling the body by allowing wet clothes to dry on the body.

——— **k.** Warming the hand by touching warm objects.

——— **l.** Heating a piece of ice floating on the surface of some water contained in a pan.

——— **m.** Baking a cake in an oven.

——— **n.** Hot-air heating system.

——— **o.** Cooling the body by resting in the shade of a tree.

——— **p.** Cooling the hand by placing it near a slab of ice.

——— **q.** Warming the body by sitting in a room heated by a fireplace.

——— **r.** Warming the body by sitting in a room with a stove.

——— **s.** The cooling of a cup of tea placed on a cork mat.

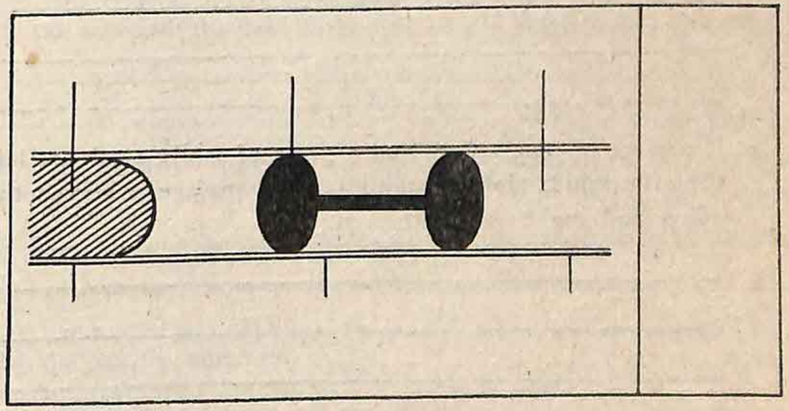
——— **t.** The cooling of a room by suspending a bucket of ice near the ceiling.

Understanding

5. The diagram represents a portion of a maximum thermometer.

a. Label the parts indicated by guide lines.

b. Mark an arrow on the diagram to show where the maximum temperature is read off the scale.



c. Write three imaginary values on the scale that is marked below.

d. In the space at the right of the diagram draw the instrument required to 'set' the thermometer.

6. Convert :

a. 35°C. to °F.

b. 77°F. to °C.

7. Express in :

a. °C. a temperature which is 54°F. below the freezing point of water on the Fahrenheit scale.

b. °F. a temperature which is 3·1°C. above the normal temperature of the human body on the Centigrade scale.

8. Account for each of the following facts.

a. Flannel clothes are worn during the winter.

b. A clinical thermometer cleaned in boiling water was found to be useless.

c. If a piece of black cloth and a piece of white cloth are laid on the snow, it is observed that the white cloth remains on the surface, whereas the black cloth sinks into the snow and makes a depression.

d. A person skating on ice is actually skating on water.

NAME ______ CLASS ______ DATE ______

e. The mercury column of a thermometer is observed to fall rapidly when a few drops of ether are placed on its bulb.

f. Thermometers at a weather station are kept high above the ground and also kept in a box to protect them from the sun.

g. The joints in a concrete pavement are filled with a compressible material such as asphalt.

h. The outer pail of a domestic ice-cream making machine is made of wood, whereas the inner can is made of metal.

i. Esquimaux find that their houses, called igloos, consisting of blocks of ice, provide good protection against the cold.

j. A quarter-pound of ice will cool a jug of lemonade more than a quarter-pound of ice water even though the ice and the ice water are at the same temperature.

k. On a warm day, when the temperature of the air and the temperature of a pool are the same, a swimmer shivers with cold when he emerges after a swim.

l. Once the water in a pan has begun to boil, the food cooking in the pan does not cook more quickly even when the heat is increased.

m. When heating water in a pan, the water must not be filled to the brim.

n. A toy balloon bursts when it is kept for a while near a fire.

o. A hollow wall packed with sawdust is more effective in preventing heat from entering or leaving a room than a hollow wall which only contains air.

p. A bottle filled with water and firmly corked with a screw stopper is placed in a freezing mixture. After some time the bottle is found to have burst.

q. Two evaporating dishes were heated on a sandbath. One was placed on a piece of asbestos, while the other was placed on a piece of iron. After a few minutes the second dish broke.

r. Blocks of ice are covered with sawdust.

s. When a thermometer is plunged into a hot liquid, the mercury level is observed to fall slightly before it begins to rise.

t. A balloon filled with hot air rises.

Score——————

Teacher's initials——————

NAME_________________________________ **CLASS**_____________ **DATE**_____________

TESTS ON CHAPTER V

ENGINES

Recall

1. State:

a. Two essential differences between the external and internal combustion engines.

i. ____

ii. ____

b. The chief difference in the working of an ordinary internal combustion engine using light fuel oil and a diesel engine using heavy fuel oil.

Recognition

2. If a statement is true, write the word true in the blank space below the statement; if false, write the word(s) which should be substituted for the italicised words to make the statement true.

a. The stroke of a four-stroke internal combustion engine which develops the force used to drive the machine is called *the compression stroke.*

b. In the case of the reciprocating steam engine it is the *sliding valve* which changes the back and forth motion of the piston to the rotating motion of the flywheel.

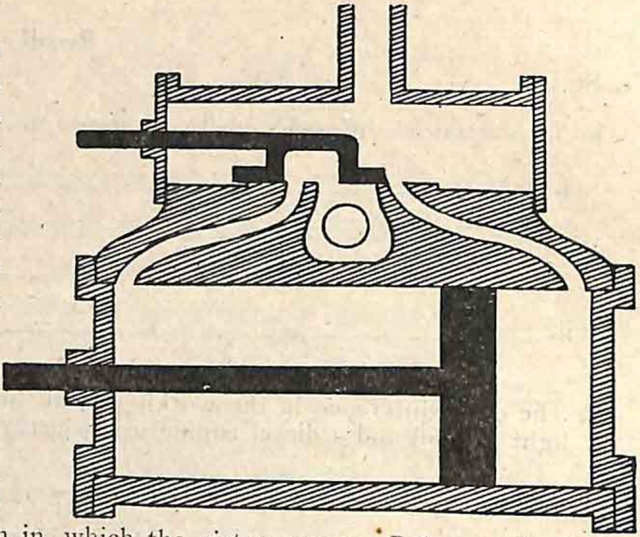
c. The force used to drive the piston of a reciprocating engine back and forth is directly obtained *from the chemical energy of the fuel in the furnace.*

d. The reciprocating steam engine is kept going, even when there is no pressure on the piston when it reaches the end of the stroke *by the inertia of the flywheel.*

e. The force developed to push a jet engine forward is from *the energy of the gases of combustion escaping from the jets.*

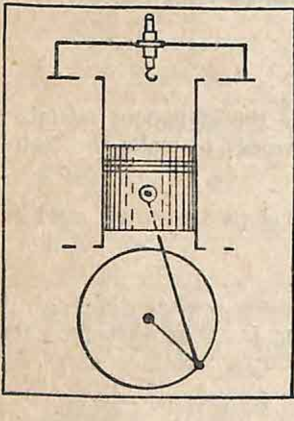
f. The type of jet engine which carries its own oxygen supply is the *turbo-jet engine.*

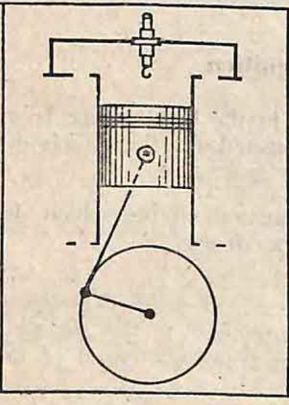
Understanding

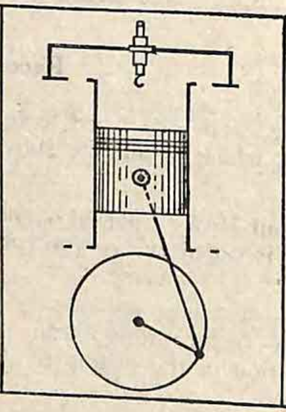


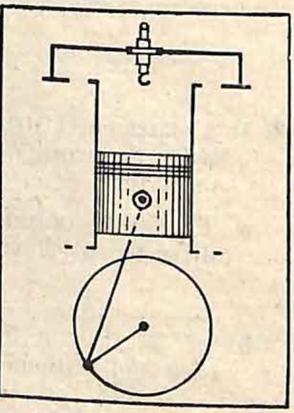
3. The diagram represents the piston of a steam engine. Insert on the diagram unbroken arrows to show the path taken by steam molecules and a feathered arrow to show the direction in which the piston is moving at the moment shown in the diagram. Indicate, by labelling on the diagram, the exhaust valve, sliding valve, valve box and cylinder.

4. In each of the diagrams given below, insert the valves to show their positions during each of the strokes of a four-stroke engine. Insert unbroken arrows to show the path taken by the fuel and feathered arrows to show the direction in which the piston moves. Below each of the completed diagrams, write the name of the stroke and a brief description of what happens to the gases in the cylinder during the stroke.









i. ____________________

ii. ____________________

iii. ____________________

iv. ____________________

Score ____________ **Teacher's initials** ____________

NAME______________________________CLASS__________DATE__________

TESTS ON CHAPTER VI

ACIDS, BASES AND SALTS

Recall

1. Define:

a. Atomic weight.

b. Valency of an atom.

c. Oxide.

d. Acid.

e. Base.

f. Alkali.

g. Salt.

h. Neutralisation.

2. State:

a. Five properties common to acids.

i.______________________________

ii. ____________________

iii. ____________________

iv. ____________________

v. ____________________

b. Three properties common to bases.

i. ____________________

ii. ____________________

iii. ____________________

3. At the right of each of the following, write its chemical formula.

a. Sulphur dioxide ____________________

b. Sodium peroxide ____________________

c. Sulphurous acid ____________________

d. Sodium sulphate ____________________

e. Zinc nitrate ____________________

4. Answer the following questions.

a. What is the chief characteristic about the way atoms form a molecule?

____

____

b. Why is it possible to have such a very large number of different substances when the number of the different constituent atoms is relatively small?

____

____

Recognition

5. Place the following in their correct column: carbon dioxide, copper oxide, sodium hydroxide, sulphur dioxide, phosphorus pentoxide, and zinc oxide.

Acid oxide	*Basic oxide*
____________	____________
____________	____________
____________	____________

NAME ________________________ CLASS ____________ DATE ____________

6. Group I is a list of the various salts mentioned in the chapter. Group II is a list of the various uses made of these salts. At the left of each of the salts mentioned in Group I write its formula and its chemical name. Select the number(s) of the use(s) made of each salt and write it (them) in the space at the right.

Group I

Formula	*Chemical name*	*Common name*	*Number(s) of use(s)*
________	________________________	Baking soda	______________
________	________________________	Caustic soda	______________
________	________________________	Condys	______________
________	________________________	Epsom salts	______________
________	________________________	Sal volatile	______________
________	________________________	Table salt	______________
________	________________________	Washing soda	______________

Group II

1. Manufacture of glass. 2. Manufacture of artificial silk. 3. For removing permanent hardness in water. 4. For flavouring food. 5. For glazing drain pipes and pottery. 6. For washing purposes. 7. Manufacture of soap and paper. 8. Disinfectant. 9. For preparing baking powder. 10. Manufacture of chlorine. 11. For preserving fish, meat, pork, etc. 12. Purgative. 13. Manufacture of smelling salts. 14. Purification of bauxite.

Understanding

7. Complete the following equations.

a. Aluminium + Oxygen → ______________________

b. Phosphorus pentoxide + ______________ → Phosphoric acid.

c. Calcium oxide + Water → ______________________

d. Magnesium oxide + Sulphuric acid → ______________________ + ______________

e. Zinc hydroxide + ______________________ → Zinc sulphate + Water.

f. ______________ + Hydrochloric acid → Calcium chloride + Water + Carbon dioxide.

g. ______________________ + Zinc → Zinc sulphate + Hydrogen.

h. Sodium hydroxide + ______________ → Sodium nitrate + Water.

8. At the right of each of the following write the acid you would use to prepare it.

a. Copper nitrate ______________________________

b. Zinc chloride ______________________________

c. Potassium sulphate ______________________________

9. What is the valency of :

a. Magnesium in Magnesium oxide?

____

b. Chlorine in hydrochloric acid ?

____

c. Nitrogen in Ammonia?

____

10. Represent graphically the linking between the atoms in the following molecules.

a. Water.

____

b. Sulphuretted hydrogen.

____

c. Sodium chloride.

____

d. Ammonia.

____

e. Zinc chloride.

____

f. Magnesium oxide.

____

11. A girl and her brother decided to make pickle from vegetables and vinegar. The boy chose an iron vessel in which to boil the vinegar. He reasoned that since iron was a good conductor of heat the vinegar would reach its boiling point very quickly. His sister, however, advised him to use an earthenware vessel instead. She knew from experience that vinegar cooked in an iron vessel gave the pickle an unsavoury flavour. What explanation can you suggest for the girl's experience?

____

____

Score__________ **Teacher's initials**__________

NAME____ CLASS____________ DATE____________

TESTS ON CHAPTER VII

CHLORINE AND HYDROCHLORIC ACID

Recall

1. What takes place when :

a. A mixture of chlorine and hydrogen is exposed to sunlight?

____

b. Chlorine is passed into cold caustic soda solution?

____

c. Chlorine is passed into hot caustic soda solution?

____

d. Chlorine water is exposed to sunlight in a sealed container?

____

____

____

e. Chlorine is passed over dry slaked lime?

____

2. State six uses of hydrochloric acid.

i.____

ii.____

iii.____

iv.____

v.____

vi.____

3. Answer the following questions.

a. Why is chlorine a poisonous gas?

____

b. Why is chlorine called a corrosive gas?

____

c. Why is chlorine used to disinfect water?

____

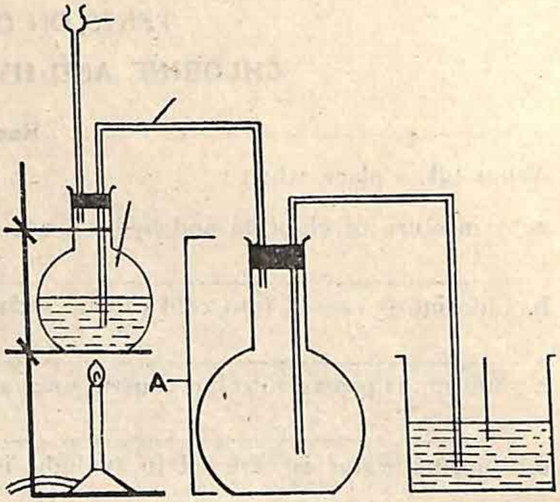
____

d. Why is chlorine a good bleaching agent?

____

____

Understanding



4. The diagram represents the apparatus used to prepare hydrochloric acid in the laboratory.
   - **a.** Draw arrows pointing to the mistakes in the arrangement of the apparatus.
   - **b.** Label the parts indicated by guide lines.
   - **c.** Write the equation, in words, for the reaction that takes place as the reacting substances come into contact with each other.
   - **d.** After the reacting substances have been in contact for some time the reaction is observed to slacken. The substances in the generating flask are thereafter gently warmed. Write the equation, in words, for the reaction that now takes place.
   - **e.** What is *A* and what is its purpose?
   - **f.** What might happen if *A* was omitted from the apparatus?

5. Name all the products formed when concentrated hydrochloric acid :
   - **a.** Is exposed to air.
   - **b.** Is warmed with manganese dioxide.
   - **c.** Is added to copper oxide.
   - **d.** Is added to sodium carbonate.
   - **e.** Reacts with magnesium.

Score

Teacher's initials

NAME______________________________________ CLASS______________ DATE______________

TESTS ON CHAPTER VIII

SULPHUR AND PHOSPHORUS

Recall

1. Name:

a. Three substances in the head of an ordinary safety match.

i.____________________ **ii.**____________________ **iii.**____________________

b. Three substances in the match-striking side of a match-box.

i.____________________ **ii.**____________________ **iii.**____________________

2. In the answers of **1** draw a single line under the oxidising agent and a double line under the igniting agent.

3. Write the equation, in words, for the laboratory preparation of sulphur dioxide.

____

4. Answer the following questions.

a. What is meant by vulcanised rubber?

____

____

b. Why is sulphur used as a disinfectant?

____

c. Why does sulphuric acid cause very serious burns when it comes into contact with the flesh?

____

d. Why does sulphur dioxide act as a bleaching agent?

____

e. Why does sulphuric acid act as a corrosive in the case of metals?

____

____

f. Why is white phosphorus stored under water?

____

g. What is the importance of phosphorus in a 'Grow-more-food' campaign?

____

____

Recognition

5. Group I is a list of chemicals dealt with in this chapter. Group II is a list of substances made from them. At the left of each of the substances in Group II write the letter(s) of the chemical(s) used in its manufacture.

Group I

A. Phosphorus
B. Sulphur
C. Sulphur dioxide
D. Sulphuric acid

Group II

——— 1. Acid-resistant material
——— 2. Artificial silk
——— 3. Carbon bisulphate
——— 4. Drugs
——— 5. Dyes
——— 6. Explosives
——— 7. Fertilisers
——— 8. Food products
——— 9. Fumigants
———10. Glucose
———11. Glue
———12. Glycerine
———13. Insecticides
———14. Matches
———15. Nitric acid
———16. Ointments
———17. Paints
———18. Paper
———19. Plastics
———20. Refrigerant
———21. Synthetic textile
———22. Tyres
———23. Varnishes
———24. Water-proof cement

Understanding

6. A boy using concentrated sulphuric acid for an experiment, accidentally dropped the bottle on the cement floor of the laboratory. There was immediate effervescence and the cement began to dissolve. Three boys working at a nearby bench rushed forward to stop the damage. The first attempted to wipe up the acid with a piece of cloth, the second poured water on the acid, while the third poured a solution of soda on it. Predict what happened in each case.

____
____
____

Score——————　　　　**Teacher's initials**——————

NAME____________________CLASS__________DATE__________

TESTS ON CHAPTER IX

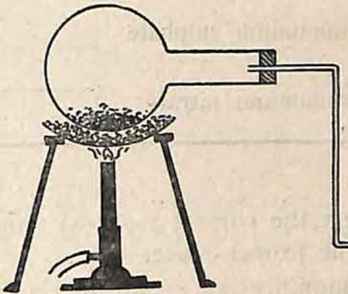
NITROGEN AND ITS COMPOUNDS

Recall

1. a. Complete the diagram so as to show the method of collecting Ammonia.

b. Label all the parts in the completed diagram.

c. Write the equation, in words, for the reaction in the flask.



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____

2. Name all the products formed when:

a. Calcium burns in Nitrogen.

____

b. Ammonia reacts with nitric acid.

____

c. Ammonia is passed into a beaker containing water.

____

d. Nitric acid reacts with calcium carbonate.

____

e. Nitric acid reacts with zinc oxide.

____

f. Carbon is oxidised by warm nitric acid.

____

3. Name five different nitrates and against each, state one of its uses.

i.______________________________

ii.______________________________

iii.______________________________

iv.______________________________

v.______________________________

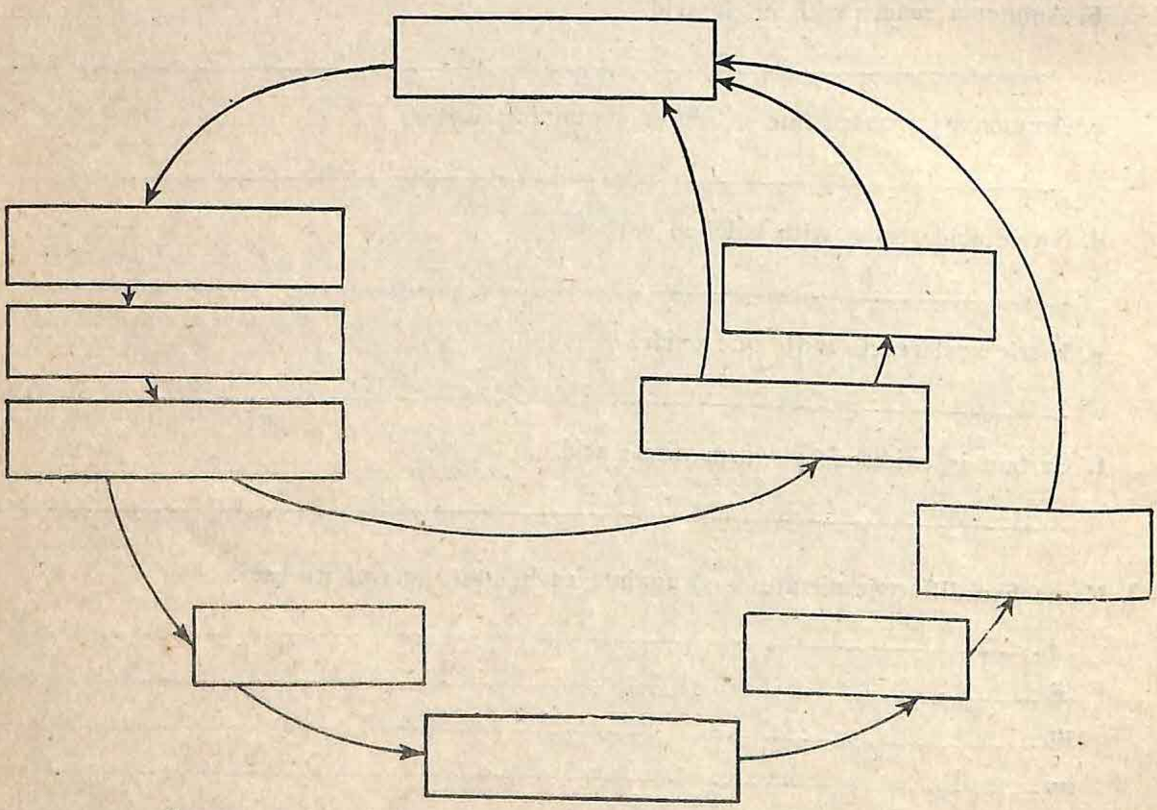
4. Complete the following table. In column 2 write the formula for the salt and in column *3* write its uses.

Salt	*Formula*	*Uses*
1	2	3
Ammonium chloride		
Ammonium sulphate		
Ammonium nitrate		

Understanding

5. Select the correct word(s) from the list given below and write it (them) on the diagram in the proper place.

Ammonification. Atmospheric nitrogen. Decay of proteins. Denitrifying bacteria. Nitrates. Nitrification. Nitrogen-fixing bacteria. Protein synthesis by animals. Protein synthesis by plants. Protein synthesis by nitrogen-fixing bacteria.



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NAME ____________________ CLASS __________ DATE __________

TESTS ON CHAPTER X
LIME AND ITS PRODUCTS

Recall

1. What takes place when:

a. Powdered marble is strongly heated in the open air until no further change occurs?

b. Water is slowly added to the residue in **a**?

c. Hard water is treated with:

i. A small amount of slaked lime?

ii. An excess of slaked lime?

2. State:

a. Three uses made of the residue left in **1. a.**

i.

ii.

iii.

b. Five uses made of the product in **1. b.**

i.

ii.

iii.

iv.

v.

c. Five reasons why lime is added to the soil.

i.

ii.

iii.

iv.

v.

d. Four steps in the formation of stalactites and stalagmites.

i. ______________________________

____

ii. ______________________________

____

iii. ______________________________

____

iv. ______________________________

____

3. Answer the following questions.

a. How does mortar act to hold bricks firmly together?

____

____

____

____

b. Why do the walls of recently built houses 'sweat'?

____

c. Why is cement a better building material than mortar?

____

____

d. How is the tensile strength of concrete improved?

____

____

Understanding

4. A workman carelessly left a bag of slaked lime in the open. After a few weeks he found that the outer layer had changed to chalk. Explain.

____

____

Score__________ **Teacher's initials**__________

NAME ________________ **CLASS** ________ **DATE** ________

TESTS ON CHAPTER XI

NUTRITION IN PLANTS AND ANIMALS

Recall

1. State the four chief steps in the digestion of food by animals having a tubular digestive system.

i. ________________

ii. ________________

iii. ________________

iv. ________________

2. a. Name the trace elements.

____

b. What effect does the lack of such elements from the soil have on plants?

____

3. Name five essential constituents of the food material of a green plant. (*N.B.* A list of elements is not required.)

____

4. a. What is an enzyme?

____

____

____

b. Name one plant enzyme and state the digestive change catalysed by it.

____

5. What is meant by:

a. Digestion?

____

____

b. Assimilation?

____

c. Synthesis?

____

Recognition

6. Group I is a list of the elements essential to plant life, while Group II is a list of consequences, each of which arises from the lack of a certain element in the soil. Select the number of the consequence which is associated with the absence of a particular element and write it at the right of the element. At the left of the elements **A, D, E, F** and **G** write the form in which it is absorbed by the plant.

Group I

_______________ **A.** Calcium _______________

B. Iron _______________

C. Magnesium _______________

_______________ **D.** Nitrogen _______________

_______________ **E.** Phosphorus _______________

_______________ **F.** Potassium _______________

_______________ **G.** Sulphur _______________

Group II

1. Chlorosis.
2. Interference of normal growth.
3. Shrivelling of storage organs.
4. Distortion in the shape of young leaves.
5. Abnormally dark leaves.

Understanding

7. In the case of an animal, digestion takes place immediately after food has entered its body. In the case of a plant, however, digestion occurs some time after food substances have entered its body. Explain.

____

____

____

____

____

Score_______________ **Teacher's initials**_______________

NAME ______ CLASS ______ DATE ______

TESTS ON CHAPTER XII

THE FROG

Recall

1. State the functions of:

a. The skeletal system.

b. Ligaments.

c. Cartilage.

d. Synovial fluid.

e. Vertebral column.

f. Pectoral girdle.

g. Pelvic girdle.

h. Skeletal muscles.

i. The nervous system.

2. Answer the following questions.

a. Why is the frog unable to close its eyes?

b. What is the advantage of an internal skeleton over an external skeleton?

c. How do you explain the loud croaking of the frog?

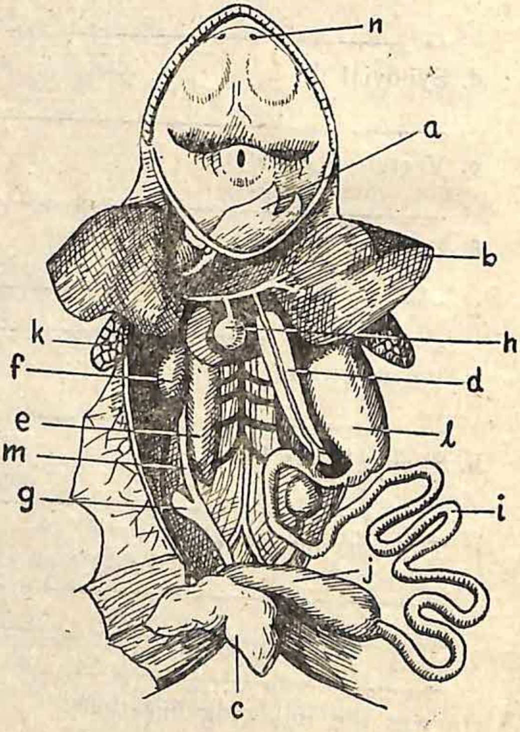
Recognition

3. On the blank spaces at the left of the following sentences write the numbers 1-9 to indicate the proper order in which a tadpole develops.

——**a.** It develops a pair of lungs.——**b.** It feeds on egg-yolk.——**c.** It develops a long, coiled gut which can be seen through the body wall.——**d.** It develops a pair of fore limbs.——**e.** It breathes through its skin.——**f.** It develops a pair of hind limbs.——**g.** It breathes through four internal gills.——**h.** It breathes through three pairs of external gills.——**i.** It breathes through two external gills.

Understanding

4. The diagram shows the general arrangement of the internal organs of the frog. Identify the parts indicated by the guide lines **a-n,** and in each case state its function.



a.——

b.——

c.——

d.——

e.——

f.——

g.——

h.——

i.——

j.——

k.——

l.——

m.——

n.——

Score——

Teacher's initials——

NAME________________________ **CLASS**____________ **DATE**____________

TEST ON CHAPTER XIII

HOW WE MOVE

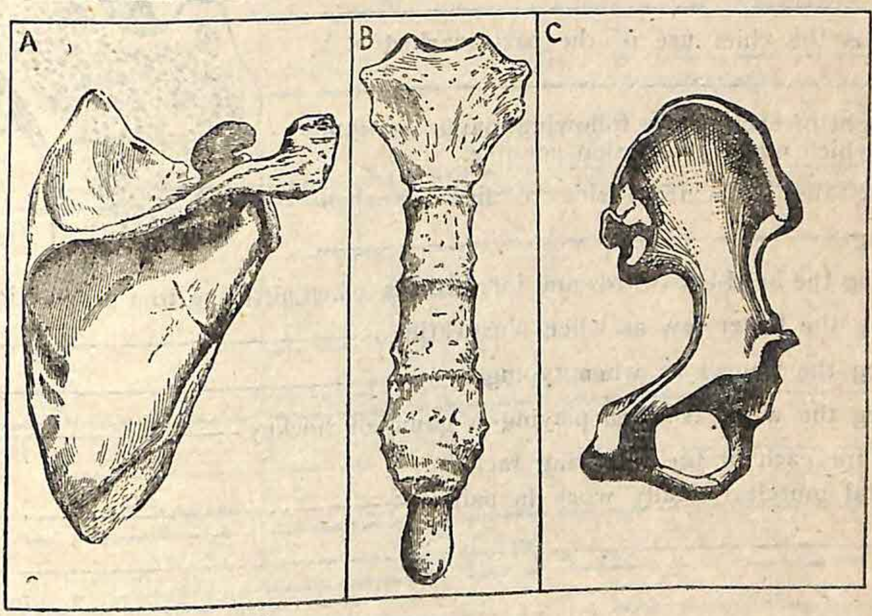
Recall

1. Identify each of the structures shown in the following diagrams and write its chief functions.

A.____

B.____

C.____



2. Answer the following questions.

a. How is provision made in the skeleton for growth?

b. What is the chief function of bone marrow and where is it found?

c. How is it possible to shrug our shoulders?____________________

Recognition

3. If a statement is true write the word true on the blank space beside the statement; if false, write the word which should be substituted for the italicised word to make the statement true.

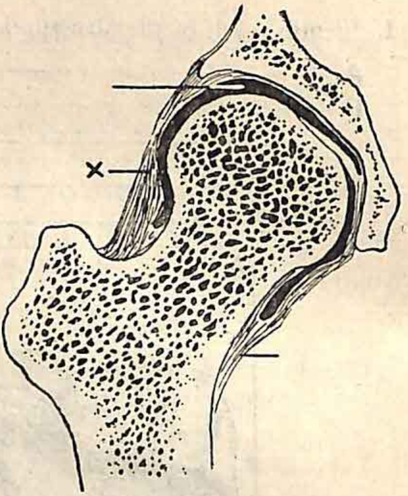
a. The muscle separating the lungs from the abdominal organs is called the *diaphragm*.

b. The *insertion* of a muscle is its point of attachment to a fixed bone.

c. The seam between two adjacent parts of a bone structure is called a *suture*.

d. The dilation and contraction of the pupil is brought about by *cardiac* muscles.

Understanding



4. a. Label the parts indicated by guide lines in the diagram of a typical joint.

b. Name the joint which is illustrated in the diagram.

c. What is the chief use of the part marked × ?

5. At the right of each of the following, name the kind of joint which makes the action possible.

a. Moving the limbs from side to side as when dancing.

b. Nodding the head backwards and forwards as when agreeing to a proposition.

c. Moving the lower jaw as when masticating.

d. Moving the fingers as when typing

e. Moving the wrist as when playing a game of hockey.

6. Account for each of the following facts.

a. Skeletal muscles usually work in pairs.

b. The vertebral column is a curved structure.

c. The eight bones of the cranium are fitted together so as to form a dome.

d. The bones of the face have numerous holes in them.

e. Each vertebra has numerous projections.

Score

Teacher's initials

NAME ____________________ CLASS __________ DATE __________

TESTS ON CHAPTER XIV

OUR FOOD, AND WHAT BECOMES OF IT

Recall

1. Complete the following tables.

a. THE WORK OF DIGESTIVE JUICES

Digestive juice	*Gland which secretes juice*	*Enzymes acting*	*Changes brought about by enzymes*	*Region where action occurs*
1	2	3	4	5
Saliva				
Gastric juice				
Pancreatic juice				
Intestinal juice				
		Action		
Bile				

b. EXCRETION OF WASTES

Organ	*Waste substances excreted*	*Special structures*	*Other functions*
1	2	3	4
Kidneys			
Skin			
Lungs			

c. CLASSES OF FOOD: THEIR HEALTH EFFECTS AND SOURCES

Class of food	*Some health effects*	*Some sources*
1	2	3
Carbohydrates		
Fats		
Proteins		
Minerals: Calcium Iron Phosphates		
Vitamin A		
Vitamin B_1		
Vitamin B_2		
Vitamin C		
Vitamin D		

NAME____________________ **CLASS**__________ **DATE**__________

2. Answer the following questions.

a. Why is roughage essential in a good diet?

____

b. How is food prevented from entering the windpipe during the act of swallowing?

____

c. How is food kept in the stomach?

____

d. Why has the inner surface of the stomach so many deep folds?

____

____

3. State:

a. Three points common to carbohydrates and fats and three points by which they differ.

i.______________________________________

ii.______________________________________

iii._____________________________________

i.______________________________________

ii.______________________________________

iii._____________________________________

b. Two points common to proteins and carbohydrates and two points by which they differ.

i.______________________________________

ii.______________________________________

i.______________________________________

ii.______________________________________

c. Four reasons why water is such an essential food substance.

i.______________________________________

ii.______________________________________

iii. ____

iv. ____

d. Four possible causes of loss of appetite.

i. ____

ii. ____

iii. ____

iv. ____

4. What is meant by:

a. A balanced diet?

b. Malnutrition?

c. Peristalsis?

d. The duodenum?

Recognition

5. Select the number of the item that best completes the statement and write it on the blank space at the left of the statement.

_____ **a.** Carbohydrates are stored in the liver in the form of (i) glyçogen; (ii) fat; (iii) glycerine; (iv) glucose.

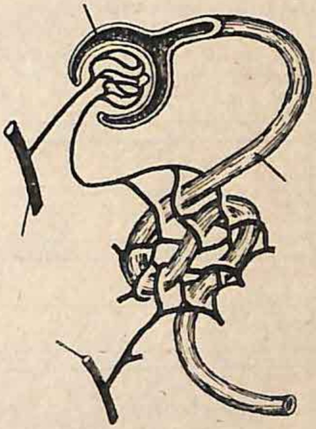
———**b.** Since children are growing they have a greater need than adults for (i) vitamins; (ii) water; (iii) proteins; (iv) carbohydrates.

———**c.** The protein-digesting enzyme of the stomach acts only in the presence of (i) rennin; (ii) saliva; (iii) hydrochloric acid; (iv) bile.

———**d.** Molars help to (i) tear food; (ii) grind food; (iii) bite food; (iv) taste food.

Understanding

6. Label the parts indicated by guide lines and in the space below write where such a structure is to be found.



____

7. On the blank spaces at the left of the following phrases write the numbers 1-13 to indicate the proper order of the steps in which an atom of calcium passes from the food in the mouth to finally become part of a tooth.

———**a.** Passes along the capillaries of the liver.

———**b.** Passes through the villi.

———**c.** Enters the heart.

———**d.** Passes through the wall of the capillary and becomes part of the tooth.

———**e.** Passes down the oesophagus.

———**f.** Passes along the vein leading to the heart.

———**g.** Passes along an artery leading from the heart.

———**h.** Enters the mouth.

———**i.** Enters the stomach.

———**j.** Passes along a vein leading to the liver.

_____**k.** Enters the capillaries within the villi.

_____**l.** Passes along a capillary which enters a tooth.

_____**m.** Enters the small intestine.

Score__________ **Teacher's initials**__________

NAME ______________________ CLASS ____________ DATE ____________

TESTS ON CHAPTER XV

OUR NERVOUS SYSTEM

Recall

1. Complete the following table.

PARTS OF THE NERVOUS SYSTEM AND THEIR FUNCTIONS

Part	*Particular system to which it belongs*	*Function(s)*
1	2	3
Cerebrum		
Cerebellum		
Pons		
Medulla		
Cranial nerves		
Spinal cord		
Spinal nerves		
Two chains of ganglia running alongside the spinal cord		

2. State:

a. The difference between the arrangement of the nerve cells in the brain and that in the spinal cord.

b. The difference between a nerve cell and any other body cell.

____

c. The difference between an afferent and an efferent nerve.

____

____

d. The difference between a sensory nerve and a motor nerve.

____

____

____

e. Three differences between a dendron and an axon.

i.______________________________

____

ii.______________________________

____

iii.______________________________

____

Recognition

3. Mark with **V** the actions that are voluntary acts and with **I** those that are involuntary acts.

______ **a.** Walking across the road when the policeman gives the signal.

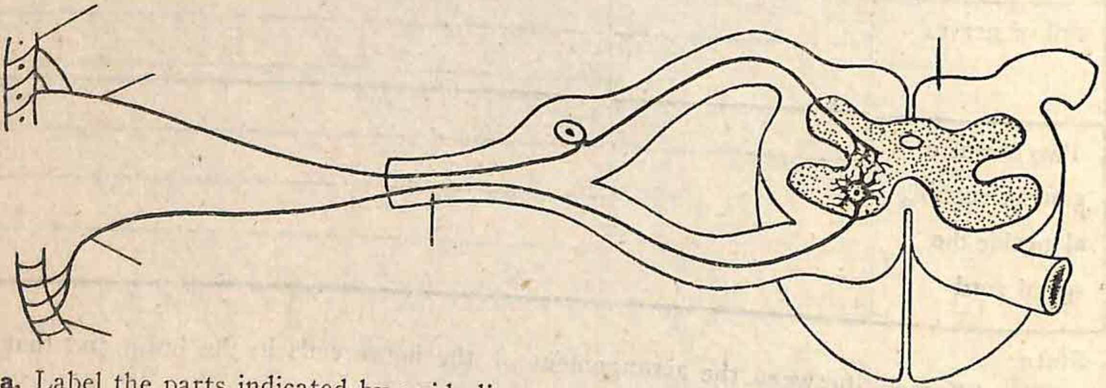
______ **b.** Jumping when someone behind you honks the horn of his car.

______ **c.** Blinking when a speck of dust enters your eye.

______ **d.** Taking off your coat when you feel warm.

Understanding

4. The diagram represents a reflex arc.



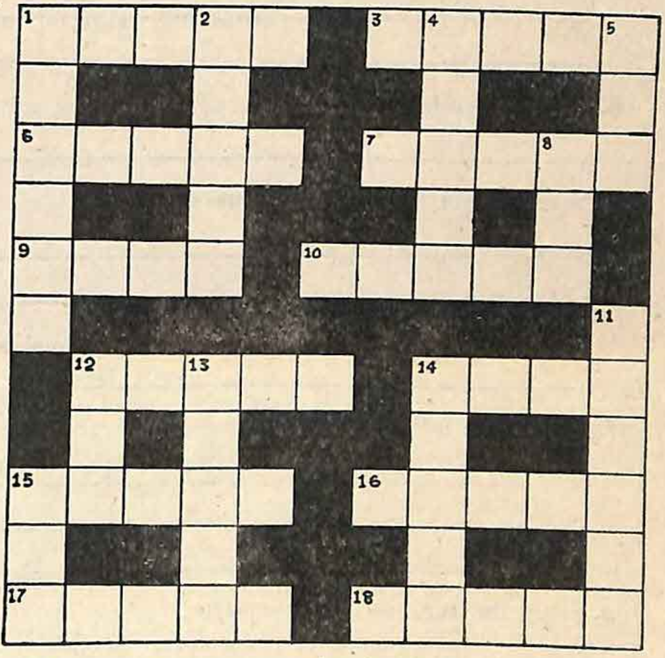
a. Label the parts indicated by guide lines. **b.** Mark arrows on the diagram to show the direction in which an impulse travels. **c.** Mark a guide line labelled **X** to show the point where the cell body of the afferent nerve fibre is situated.

Score______________ **Teacher's initials**______________

NAME________________________ **CLASS**____________ **DATE**____________

TESTS ON BOOK III

1. Do this crossword puzzle.



Clues across

1. It allows fluid to flow in one direction and not the other. 3. The material of which the knife-edge of a balance is made. 6. The nerve of sight. 7. When using the winch, you must turn the crank in order to ——the load. 9. A stage in the life-history of a frog. 10. An indispensable part of the minimum thermometer. 12. A compound containing oxygen and another element. 14. Besides being under standard atmospheric pressure, a substance must be this in order to boil at its true boiling point. 15. A rich source of carbohydrates. 16. The many tiny projections of the lining of the small intestine into which digested foods are absorbed. 17. Chiefly concerned with support and protection in the body of a vertebrate. 18. The region of complete shadow that is thrown on the earth's surface during an eclipse of the sun.

Clues down

1. The colour which occurs at the outermost edge of the visible spectrum. 2. Tubes bringing blood to the heart. 4. A tissue or group of tissues which produces and gives out a special body fluid. 5. It is often likened to a camera. 8. The number of muscles controlling the movement of the eye-ball. 11. The innermost coat of the eye which is sensitive to light impressions. 12. An example of the first class of lever. 13. The optical counterpart of an object. 14. It disperses white light into all the different colours. 15. The metal weight which hangs from a pendulum.

2. Distinguish between each of the following pairs.

a. A real image and a virtual image.

____

b. A basic oxide and an acidic oxide.

____

____

____

c. Stalactities and stalagmites.

d. Fats and oils.

e. Sensory nerves and motor nerves.

f. Excretion and secretion.

g. Grey matter and white matter.

3. Name

a. The constant that can be obtained by plotting the cooling curve of a melting solid.

b. Three gases used as refrigerants.

i. ____ **ii.** ____ **iii.** ____

c. Three raw materials that go into the making of mortar.

i. ____ **ii.** ____ **iii.** ____

d. An element essential to green plants not obtained from the soil.

e. A chemical substance that can be used for bleaching coloured cloth.

f. The class of lever which is used when:

i. The body stands on tip-toe. ____

ii. The foot is bent, as in raising the toes. ____________

iii. The heel being previously raised from the ground, the foot is extended so that the toes tap the ground. ____________

g. The vessel carrying fats away from the small intestine.

____

h. The liquid filling the ventricles of the brain and the hollow of the spinal cord.

____

i. The nerve concerned with smell.

____

j. The element present in all acids.

____

k. One compound of chlorine used in our daily food.

____

l. Three diseases which can be curbed by sulpha drugs.

i. ________ **ii.** ________ **iii.** ________

m. The industrial process which is used to combine the nitrogen of the air with hydrogen to produce ammonia.

____

n. Three substances which decrease in density on solidification.

i. ________ **ii.** ________ **iii.** ________

o. Two factors which alter the melting point or boiling point of a substance.

i. ________ **ii.** ________

4. What tests would you perform in the laboratory to distinguish:

a. Powdered slaked lime from powdered chalk?

____

b. Hydrochloric acid, sulphuric acid and nitric acid from each other?

____

____

____

____

____

____

____

Teacher's initials________

Score________

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